AMENDMENTS TO THE CLAIMS

1-50. (Canceled)

51. (Currently Amended) A method for recognizing a pattern in information comprising data, the method comprising:

producing data representative of one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest with a transducer;

inputting said data into ~~an electronic device~~a computer comprising a memory and a display device;

encoding, in said computer, said data as parameters of a plurality of Fourier components in Fourier space;

adding at least two of said Fourier components together to form at least one Fourier series in Fourier space;

sampling at least one of said Fourier series in Fourier space with a filter to form a sampled Fourier series;

modulating said sampled Fourier series in Fourier space with said filter to form a modulated Fourier series;

determining a spectral similarity between said modulated Fourier series and another Fourier series;

determining a probability expectation value based on said spectral similarity;

generating a probability operand based on said probability expectation value;

selecting a desired value for said probability operand, wherein recognition of a pattern in said information is obtained when said probability operand has said desired value; and

~~outputting~~displaying said recognized pattern on said display device ~~from the electronic device~~.

52. (Previously Presented) A method according to claim 51, further comprising adding said modulated Fourier series and said another Fourier series to form a string of Fourier series in Fourier space when said probability operand has said desired value.

53. (Previously Presented) A method according to claim 52, further comprising storing said string of Fourier series to a memory.

54. (Previously Presented) A method according to claim 51, wherein said another Fourier series represents known information.

55. (Previously Presented) A method according to claim 51, wherein said steps of adding said plurality of Fourier components together, sampling at least one of said plurality of Fourier series in Fourier space, modulating said sampled Fourier series in Fourier space, determining a spectral similarity between said modulated Fourier series and another one of said plurality of Fourier series, determining a probability expectation value, and generating a probability operand are repeated until a said probability operand has said desired value.

56. (Previously Presented) A method according to claim 51, wherein said value of said probability operand is selected from a set of zero and one; and wherein said desired value is one.

57. (Previously Presented) A method according to claim 51, wherein said step of encoding data further comprises modulating at least one of said Fourier components to provide an input context.

58. (Previously Presented) A method according to claim 57, wherein inputted information comprises said data and an input context, said input context mapping on a one to one basis to a physical context, said physical context being a relationship between physical characteristics represented by said inputted information.

59. (Previously Presented) A method according to claim 51, wherein each Fourier component of said at least one Fourier series comprises a quantized amplitude, a frequency, or a phase angle.

60. (Previously Presented) A method according to claim 51, wherein said step of adding at least two Fourier components together is conducted to provide at least two Fourier series.

61. (Previously Presented) A method according to claim 51, wherein said data is representative of physical characteristics and said Fourier series in Fourier space is selected from one of:

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}N_{m_{\rho_0}}N_{m_{z_0}}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_m}}\right)\frac{N_{m_{\rho 0}}\rho_{0_m}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_m}}\right)\frac{N_{m_{z0}}z_{0_m}}{2}\right)$$

and

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}\frac{4}{\rho_{0_m}z_{0_m}}a_{0_m}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_m}}\right)\frac{N_{m_{\rho 0}}\rho_{0_m}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_m}}\right)\frac{N_{m_{z0}}z_{0_m}}{2}\right)$$

wherein a_{0_m} is a constant, k_ρ and k_z are the frequency variables, n, m, and M are integers, and $N_{m_{\rho_0}}$, $N_{m_{z_0}}$, ρ_{0_m}, and z_{0_m} are data parameters.

62. (Previously Presented) A method according to claim 61, wherein each of $N_{m_{\rho 0}}$ and $N_{m_{z0}}$ is proportional to a rate of change of said physical characteristics, and each of ρ_{0_m} and z_{0_m} is inversely proportional to an amplitude of said physical characteristics.

63. (Previously Presented) A method according to claim 61, wherein each of $N_{m_{\rho 0}}$ and $N_{m_{z0}}$ is proportional to said amplitude of said physical characteristics, and each of ρ_{0_m} and z_{0_m} is inversely proportional to said rate of change of said physical characteristics.

64. (Previously Presented) A method according to claim 61, wherein each of $N_{m_{\rho 0}}$ and $N_{m_{z0}}$ is proportional to a duration of a signal response of at least one input transducer; and each of ρ_{0_m} and z_{0_m} is inversely proportional to said physical characteristics.

65. (Previously Presented) A method according to claim 57, wherein step of encoding said data further comprises encoding said input context as a characteristic time delay which corresponds to a characteristic modulation of said Fourier components or Fourier series at a frequency within a band.

66. (Previously Presented) A method according to claim 65, wherein said characteristic modulation frequency band represents said input context according to at least one of a transducer, specific transducer element, and fundamental relationships including a physical context, a temporal order, a cause and effect relationship including a temporal order, a size order, an intensity order, a before-and-after order, a top-and-bottom order, and a left-and-right order.

67. (Previously Presented) A method according to claim 66, wherein said transducer has n levels of subcomponents, and is assigned a master time interval with n+1 sub time intervals in a hierarchical manner corresponding to said n levels of the transducer subcomponents, and wherein a data stream from a n^{th} level subcomponent of said transducer is recorded as a function of time in the n+1 sub time intervals, each of said n+1 time intervals representing a time delay that corresponds to said characteristic modulation frequency band representing said input context.

68. (Previously Presented) A method according to claim 67, wherein the input context is based on the identity of the specific transducer and transducer subcomponents.

69. (Previously Presented) A method according to claim 65, wherein the characteristic modulation having a frequency within the band in Fourier space is represented by $e^{-j2\pi f t_0}$ which corresponds to the time delay $\delta(t - t_0)$ wherein f is the frequency variable, t is the time variable, and t_0 is the time delay.

70. (Previously Presented) A method according to claim 69, wherein the step of adding at least two Fourier components together further comprises storing the characteristic modulation frequency in a distinct memory location within the band encoded as a delay in time.

71. (Previously Presented) A method according to claim 69, wherein the Fourier series in Fourier space, has a characteristic modulation having a frequency within the band represented by $e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}$ and is selected from one of:

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}N_{m_{\rho_0}}N_{m_{z_0}}e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}\sin\left(k_\rho\frac{N_{m_{\rho_0}}\rho_{0_m}}{2}-n\frac{2\pi N_{m_{\rho_0}}}{2}\right)\sin\left(k_z\frac{N_{m_{z_0}}z_{0_m}}{2}-n\frac{2\pi N_{m_{z_0}}}{2}\right)$$

and

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}\frac{4}{\rho_{0_m}z_{0_m}}e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}\sin\left(k_\rho\frac{N_{m_{\rho_0}}\rho_{0_m}}{2}-n\frac{2\pi N_{m_{\rho_0}}}{2}\right)\sin\left(k_z\frac{N_{m_{z_0}}z_{0_m}}{2}-n\frac{2\pi N_{m_{z_0}}}{2}\right)$$

wherein $\rho_{t_m}=v_{t_m}t_{t_m}$ is the modulation factor which corresponds to the physical time delay t_{t_m}, $\rho_{fb_m}=v_{fb_m}t_{fb_m}$ is the modulation factor which corresponds to the specific transducer time delay t_{fb_m}, v_{t_m} and v_{fb_m} are constants such as the signal propagation velocities, a_{0_m} is a constant, k_ρ and k_z are the frequency variables, n, m, and M are integers, and $N_{m_{\rho_0}}$, $N_{m_{z_0}}$, ρ_{0_m}, and z_{0_m} are data parameters.

72. (Previously Presented) A method according to claim 71, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

73. (Previously Presented) A method according to claim 71, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude

of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

74. (Previously Presented) A method according to claim 71, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

75. (Previously Presented) A method according to claim 69, wherein the string has a characteristic modulation having a frequency within the band represented by $e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}$ is selected from one of:

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}N_{s,m_{\rho_0}}N_{s,m_{z_0}}e^{-jk_\rho(\rho_{fb_{s,m}}+\rho_{t_{s,m}})}$$

$$\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

and

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}\frac{4}{\rho_{0_{s,m}}z_{0_{s,m}}}e^{-jk_\rho(\rho_{fb_{s,m}}+\rho_{t_{s,m}})}$$

$$\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

wherein $\rho_{t_{s,m}}=v_{t_{s,m}}t_{t_{s,m}}$ is the modulation factor which corresponds to the physical time delay $t_{t_{s,m}}$, $\rho_{fb_{s,m}}=v_{fb_{s,m}}t_{fb_{s,m}}$ is the modulation factor which corresponds to the specific transducer time delay $t_{fb_{s,m}}$, $v_{t_{s,m}}$ and $v_{fb_{s,m}}$ are constants such as the signal propagation velocities, $a_{0_{s,m}}$ is a constant, k_ρ and k_z are the frequency variables, n, m, s, M_s, and S are integers, and $N_{s,m_{\rho_0}}$, $N_{s,m_{z_0}}$, $\rho_{0_{s,m}}$, and $z_{0_{s,m}}$ are data parameters.

76. (Previously Presented) A method according to claim 75, wherein each of the data parameters $N_{m\rho_0}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

77. (Previously Presented) A method according to claim 75, wherein each of the data parameters $N_{m\rho_0}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

78. (Previously Presented) A method according to claim 75, wherein each of the data parameters $N_{m\rho_0}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

79. (Previously Presented) A method according to claim 69, wherein the Fourier series in Fourier space, has a characteristic modulation having a frequency within the band represented by $e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}$ and is selected from one of:

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}N_{m_{\rho_0}}N_{m_{z_0}}e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}\sin\left(k_\rho\frac{N_{m_{\rho_0}}\rho_{0_m}}{2}-n\frac{2\pi N_{m_{\rho_0}}}{2}\right)\sin\left(k_z\frac{N_{m_{z_0}}z_{0_m}}{2}-n\frac{2\pi N_{m_{z_0}}}{2}\right)$$

and

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}\frac{4}{\rho_{0_m}z_{0_m}}e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}\sin\left(k_\rho\frac{N_{m_{\rho_0}}\rho_{0_m}}{2}-n\frac{2\pi N_{m_{\rho_0}}}{2}\right)\sin\left(k_z\frac{N_{m_{z_0}}z_{0_m}}{2}-n\frac{2\pi N_{m_{z_0}}}{2}\right)$$

wherein $\rho_{t_m}=v_{t_m}t_{t_m}$ is the modulation factor which corresponds to the physical time delay t_{t_m}, $\rho_{fb_m}=v_{fb_m}t_{fb_m}$ is the modulation factor which corresponds to the specific transducer time delay t_{fb_m}, v_{t_m} and v_{fb_m} are constants such as the signal propagation velocities, a_{0_m} is a

constant, k_ρ and k_z are the frequency variables, n, m, and M are integers, and $N_{m_{\rho_0}}$, $N_{m_{z_0}}$, ρ_{0_m}, and z_{0_m} are data parameters.

80. (Previously Presented) A method according to claim 79, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

81. (Previously Presented) A method according to claim 79, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

82. (Previously Presented) A method according to claim 79, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

83. (Previously Presented) A method according to claim 79, wherein each Fourier series of the string is multiplied by the Fourier transform of the delayed Gaussian filter represented by $e^{-\frac{1}{2}\left(v_{s\rho 0}\frac{k_\rho}{\alpha_{s\rho 0}}\right)^2} e^{-j\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}(v_{s\rho 0}k_\rho)} e^{-\frac{1}{2}\left(v_{sz0}\frac{k_z}{\alpha_{sz0}}\right)^2} e^{-j\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}(v_{sz0}k_z)}$ wherein the filter established the association to form the string, wherein the string is represented by:

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}} a_{0_{s,m}} N_{s,m_{\rho_0}} N_{s,m_{z_0}} e^{-\frac{1}{2}\left(v_{s\rho 0}\frac{k_\rho}{\alpha_{s\rho 0}}\right)^2} e^{-j\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}(v_{s\rho 0}k_\rho)} e^{-\frac{1}{2}\left(v_{sz0}\frac{k_z}{\alpha_{sz0}}\right)^2} e^{-j\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}(v_{sz0}k_z)}$$

$$e^{-jk_\rho\left(\rho_{fb_{s,m}}+\rho_{ts,m}\right)}\sin\left(\left(k_\rho - n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z - n\frac{2\pi}{v_{s,m}t_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

wherein $v_{s\rho 0}$ and v_{sz0} are constants such as the signal propagation velocities in the ρ and z directions, respectively, $\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}$ and $\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}$ are delay parameters and $\alpha_{s\rho 0}$ and α_{sz0} are half-width parameters of a corresponding Gaussian filter in the ρ and z directions, respectively, $\rho_{t_{s,m}} = v_{t_{s,m}} t_{t_{s,m}}$ is the modulation factor which corresponds to the physical time delay $t_{t_{s,m}}$, $\rho_{fb_{s,m}} = v_{fb_{s,m}} t_{fb_{s,m}}$ is the modulation factor which corresponds to the specific transducer time delay $t_{fb_{s,m}}$, $v_{t_{s,m}}$ and $v_{fb_{s,m}}$ are constants such as the signal propagation velocities, $a_{0_{s,m}}$ is a constant, k_ρ and k_z are the frequency variables, n, m, s, M_s, and S are integers, and $N_{s,m_{\rho_0}}$, $N_{s,m_{z_0}}$, $\rho_{0_{s,m}}$, and $z_{0_{s,m}}$ are data parameters.

84. (Previously Presented) A method according to claim 83, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

85. (Previously Presented) A method according to claim 83, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

86. (Previously Presented) A method according to claim 83, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

87. (Previously Presented) A method according to claim 51, wherein the step of adding at least two of said Fourier components together further comprises creating transducer strings by obtaining a Fourier series from at least two selected transducers and adding the Fourier series.

88. (Previously Presented) A method according to claim 87, further comprises selecting transducers that are active simultaneously.

89. (Previously Presented) A method according to claim 88, wherein the transducer string is stored in a distinct memory location wherein a characteristic modulation having a frequency within the band in Fourier space is represented by $e^{-j2\pi f t_0}$ which corresponds to the time delay $\delta(t-t_0)$ wherein f is the frequency variable, t is the time variable, and t_0 is the time delay.

90. (Previously Presented) A method according to claim 89, wherein the step of adding at least two of said Fourier components together further comprises recalling any part of the transducer string from the distinct memory location which thereby causes additional Fourier series of the transducer string to be recalled.

91. (Previously Presented) A method according to claim 51, wherein the filter is a time delayed Gaussian filter in the time domain.

92. (Previously Presented) A method according to claim 91, wherein the Gaussian filter comprises a plurality of cascaded stages each stage having a decaying exponential system function between stages.

93. (Previously Presented) A method according to claim 92, wherein the Gaussian filter is modulated in the time domain to produce a frequency shift of the sampling and modulation in the frequency domain.

94. (Previously Presented) A method according to claim 91, wherein the filter is characterized in time by:

$$\frac{\alpha}{\sqrt{2\pi}} e^{-\frac{\left(t-\frac{\sqrt{N}}{\alpha}\right)^2}{\frac{2}{\alpha^2}}}$$

wherein $\frac{\sqrt{N}}{\alpha}$ is a delay parameter, α is a half-width parameter, and t is the time parameter.

95. (Previously Presented) A method according to claim 94, wherein the filter, in frequency space, is characterized by:

$$e^{-\frac{1}{2}\left(\frac{2\pi f}{\alpha}\right)^2} e^{-j\sqrt{N}\left(\frac{2\pi f}{\alpha}\right)}$$

wherein $\frac{\sqrt{N}}{\alpha}$ and α are a corresponding delay parameter and a half-width parameter in time, respectively, and f is the frequency parameter.

96. (Previously Presented) A method according to claim 51, wherein the probability expectation value is based upon Poissonian probability.

97. (Previously Presented) A method according to claim 96, wherein the probability expectation value is characterized by

$$\prod_s \left[p_{\uparrow_s} + \left(P - p_{\uparrow_s}\right) \exp\left[-\beta_s^{-2} \left(\frac{1-\cos 2\phi_s}{2} \right) \right] \cos\left(\delta_s + 2\sin\phi_s\right) \right]$$

wherein P is the maximum probability of at least one other Fourier series being associated with a first Fourier series, $p_{\uparrow_s}$ is a probability of at least one other Fourier series being associated with a first Fourier series in the absence of coupling of the first Fourier series with the at least one other Fourier series, β_s^2 is a number that represents the amplitude of spectral similarity between at least two filtered or unfiltered Fourier series, ϕ_s represents the frequency difference angle between at least two filtered or unfiltered Fourier series, and δ_s, is a phase factor.

98. (Previously Presented) A method according to claim 97, wherein β_s^2 is characterized by

$$\beta_s^2 = (8\pi)^2 \frac{1}{\sqrt{2\pi}} \sqrt{\frac{\alpha_1^2 \alpha_s^2}{\alpha_1^2 + \alpha_s^2}}$$

$$\sum_{m_1=1}^{M_1} a_{0_{m_1}} N_{m_1} \sum_{m_s=1}^{M_s} a_{0_{m_s}} N_{m_s} \exp - \left\{ \frac{\frac{\alpha_1^2 \alpha_s^2}{\alpha_1^2 + \alpha_s^2} \left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \frac{N_{m_1} \rho_{0_{m_1}}}{2v_{m_1}} - \frac{N_{m_s} \rho_{0_{m_s}}}{2v_{m_s}} \right)^2}{2} \right\}$$

$\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1 and M_s are integers, $a_{0_{m_1}}$ and $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

99. (Previously Presented) A method according to claim 98, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

100. (Previously Presented) A method according to claim 98, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

101. (Previously Presented) A method according to claim 98, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

102. (Previously Presented) A method according to claim 97, wherein ϕ_s is characterized by

$$\phi_s = \frac{\pi\left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \sum_{m_1=1}^{M_1} \frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} - \sum_{m_s=1}^{M_s} \frac{N_{m_s}\rho_{0_{m_s}}}{2v_{m_s}}\right)}{\frac{\sqrt{N_1}}{\alpha_1} + \sum_{m_1=1}^{M_1} \frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}}}$$

$\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1 and M_s are integers, $a_{0_{m_1}}$ and $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1} , N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

103. (Previously Presented) A method according to claim 102, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

104. (Previously Presented) A method according to claim 102, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

105. (Previously Presented) A method according to claim 102, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

106. (Previously Presented) A method according to claim 97, wherein β_s^2 is characterized by

$$\beta_s^2 = (8\pi)^2 \frac{1}{\sqrt{2\pi}} \sqrt{\frac{\alpha_1^2 \alpha_s^2}{\alpha_1^2 + \alpha_s^2}} \sum_{m_1=1}^{M_1} a_{0_{m_1}} N_{m_1} \sum_{m_s=1}^{M_s} a_{0_{m_s}} N_{m_s}$$

$$\exp - \left\{ \frac{\frac{\alpha_1^2 \alpha_s^2}{\alpha_1^2 + \alpha_s^2} \left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \left(\frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}} \right) - \left(\frac{N_{m_s}\rho_{0_{m_s}}}{2v_{m_s}} + \frac{\rho_{fb_{m_s}}}{v_{fb_{m_s}}} + \frac{\rho_{t_{m_s}}}{v_{t_{m_s}}} \right) \right)^2}{2} \right\}$$

wherein $\rho_{t_{m_1}} = v_{t_{m_1}} t_{t_{m_1}}$ and $\rho_{t_{m_s}} = v_{t_{m_s}} t_{t_{m_s}}$ are the modulation factors which corresponds to the physical time delays $t_{t_{m_1}}$ and $t_{t_{m_s}}$, respectively, $\rho_{fb_{m_1}} = v_{fb_{m_1}} t_{fb_{m_1}}$ and $\rho_{fb_{m_s}} = v_{fb_{m_s}} t_{fb_{m_s}}$ are the modulation factors which corresponds to the specific transducer time delay $t_{fb_{m_1}}$ and $t_{fb_{m_s}}$, respectively, $v_{t_{m_1}}$, $v_{t_{m_s}}$, $v_{fb_{m_1}}$, and $v_{fb_{m_s}}$ are constants such as the signal propagation velocities, $\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1 and M_s are integers, $a_{0_{m_1}}$, $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

107. (Previously Presented) A method according to claim 106, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

108. (Previously Presented) A method according to claim 106, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude

of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

109. (Previously Presented) A method according to claim 106, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

110. (Previously Presented) A method according to claim 97, wherein ϕ_s is characterized by

$$\phi_s = \frac{\pi\left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \sum_{m_1=1}^{M_1}\left(\frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}}\right) - \sum_{m_s=1}^{M_s}\left(\frac{N_{m_s}\rho_{0_{m_s}}}{2v_{m_s}} + \frac{\rho_{fb_{m_s}}}{v_{fb_{m_s}}} + \frac{\rho_{t_{m_s}}}{v_{t_{m_s}}}\right)\right)}{\frac{\sqrt{N_1}}{\alpha_1} + \sum_{m_1=1}^{M_1}\left(\frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}}\right)}$$

wherein $\rho_{t_{m_1}} = v_{t_{m_1}} t_{t_{m_1}}$ and $\rho_{t_{m_s}} = v_{t_{m_s}} t_{t_{m_s}}$ are the modulation factors which corresponds to the physical time delays $t_{t_{m_1}}$ and $t_{t_{m_s}}$, respectively, $\rho_{fb_{m_1}} = v_{fb_{m_1}} t_{fb_{m_1}}$ and $\rho_{fb_{m_s}} = v_{fb_{m_s}} t_{fb_{m_s}}$ are the modulation factors which corresponds to the specific transducer time delay $t_{fb_{m_1}}$ and $t_{fb_{m_s}}$, respectively, $v_{t_{m_1}}$, $v_{t_{m_s}}$, $v_{fb_{m_1}}$, and $v_{fb_{m_s}}$ are constants such as the signal propagation velocities, $\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1, and M_s are integers, $a_{0_{m_1}}$ and $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

111. (Previously Presented) A method according to claim 110, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of

change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

112. (Previously Presented) A method according to claim 110, wherein each of the data parameters $N_{m\rho_0}$ and $N_{m z_0}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

113. (Previously Presented) A method according to claim 110, wherein each of the data parameters $N_{m\rho_0}$ and $N_{m z_0}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

114. (Previously Presented) A method according to claim 51, further comprising linking at least two Fourier series stored in a memory comprising the steps of

a.) generating a probability expectation value that recalling any part of one of the Fourier series from the memory causes at least another Fourier series to be recalled from the memory;

b.) storing the probability expectation value to memory;

c.) generating a probability operand based on the probability expectation value, and

d.) recalling the at least another Fourier series from the memory if the operand has a desired value.

115. (Previously Presented) A method according to claim 114, wherein said probability operand is a value selected from a set of zero and one value selected from a set of zero and one.

116. (Previously Presented) A method according to claim 115, wherein said desired value is one.

117. (Previously Presented) A method according to claim 114, whereby the probability expectation value increases with a rate of recalling any part of any of the Fourier series.

118. (Previously Presented) A method for recognizing a pattern in information, the method comprising:

producing data relating to said information with a transducer, wherein said information is representative of one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest;

inputting said data into a computer comprising a memory and a display device;

representing the information in said memory as a plurality of Fourier series in Fourier space;

forming associations between at least two of the Fourier series by modulating and sampling the Fourier series with filters and by coupling the filtered Fourier series based on a probability distribution, wherein when at least two of the Fourier series have been associated recognition of a pattern in the information is achieved; and

outputting, using said display device, a recognized pattern in the information.

119. (Previously Presented) A method according to claim 118, wherein coupling is based on spectral similarity of said Fourier series.

120. (Previously Presented) A method according to claim 118, further comprising adding the associated Fourier series to form a string, and ordering the string.

121. (Previously Presented) A method according to claim 118, wherein the filter is a time delayed Gaussian filter in the time domain.

122. (Previously Presented) A method according to claim 118, wherein the probability distribution is Poissonian.

123. (Previously Presented) A method according to claim 120, wherein the string is selected from one of:

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}N_{s,m_{\rho_0}}N_{s,m_{z_0}}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

and

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}\frac{4}{\rho_{0_{s,m}}z_{0_{s,m}}}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

wherein $a_{0_{s,m}}$ is a constant, k_ρ and k_z are the frequency variables, n, m, s, M_s, and S are integers, and $N_{s,m_{\rho_0}}$, $N_{s,m_{z_0}}$, $\rho_{0_{s,m}}$, and $z_{0_{s,m}}$ are data parameters.

124. (Previously Presented) A method according to claim 123, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

125. (Previously Presented) A method according to claim 123, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

126. (Previously Presented) A method according to claim 123, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

127. (Currently Amended) A method for recognizing a pattern in information and establishing an order formatted pattern in information with respect to standard ordered information, the method comprising:

a.) obtaining a string comprising a sum of Fourier series from a memory of a computer, said string representing information representative of one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest;

b.) selecting, using the computer, at least two filters from a selected set of filters;

c.) sampling, using the computer, the string with the filters such that each of the filters produces a sampled Fourier series, each Fourier series comprising a subset of the string;

d.) modulating, using the computer each of the sampled Fourier series in Fourier space with the corresponding selected filter such that each filter produces an order formatted Fourier series;

e.) adding, using the computer the order formatted Fourier series produced by each filter to form a summed Fourier series in Fourier space;

f.) obtaining an ordered Fourier series from the memory;

g.) determining, using the computer a spectral similarity between the summed Fourier series and the ordered Fourier series;

h.) determining, using the computer, a probability expectation value based on the spectral similarity;

i.) generating, using the computer, a probability operand based on the probability expectation value;

j.) repeating steps b-i until the probability operand has a desired value, when the probability operand has a desired value a pattern in information has been recognized and an order formatted pattern in the information has been established;

k.) storing the summed Fourier series to an intermediate memory;

l.) removing the selected filters from the selected set of filters to form an updated set of filters;

m.) removing the subsets from the string to obtain an updated string;

n.) selecting an updated filter from the updated set of filters;

o.) sampling the updated string with the updated filter to form a sampled Fourier series comprising a subset of the string;

p.) modulating the sampled Fourier series in Fourier space with the corresponding selected updated filter to form an updated order formatted Fourier series;

q.) recalling the summed Fourier series from the intermediate memory;

r.) adding the updated order formatted Fourier series to the summed Fourier series from the intermediate memory to form an updated summed Fourier series in Fourier space;

s.) obtaining an updated ordered Fourier series from the high level memory;

t.) determining a spectral similarity between the updated summed Fourier series and the updated ordered Fourier series;

u.) determining a probability expectation value based on the spectral similarity;

v.) generating a probability operand based on the probability expectation value;

w.) repeating steps n-v until the probability operand has a desired value or all of the updated filters have been selected from the updated set of filters, when the probability operand has a desired value a pattern in information has been recognized an order formatted pattern in the information has been established;

x.) if all of the updated filters have been selected before the probability operand has a desired value, then clearing the intermediate memory and returning to step b;

y.) if the probability operand has a desired value, then storing the updated summed Fourier series to the intermediate memory;

z.) repeating steps l-y until one of the following set of conditions is satisfied: the updated set of filters is empty, or the remaining subsets of the string of step m.) is nil; and

aa.) storing the Fourier series in the intermediate memory in the high level memory of said computer.

128. (Previously Presented) A method according to claim 127, wherein information is represented by a sum of Fourier series in Fourier space.

129. (Previously Presented) A method according to claim 127, further comprising encoding data which includes modulating at least one of said Fourier components to provide an input context.

130. (Previously Presented) A method according to claim 127, wherein inputted information comprises data and an input context, said input context mapping on a one to one basis to a physical context, said physical context being a relationship between physical characteristics represented by said inputted information.

131. (Previously Presented) A method according to claim 127, wherein each Fourier component of said at least one Fourier series comprises a quantized amplitude, a frequency, or a phase angle.

132. (Previously Presented) A method according to claim 127, wherein said probability operands having a value selected from a set of zero and one.

133. (Previously Presented) A method according to claim 132, wherein said desired values are one.

134. (Previously Presented) A method according to claim 127, wherein the high level memory is initialized with standard inputs.

135. (Previously Presented) A method according to claim 127, wherein the ordering is according to one of temporal order, cause and effect relationships, size order, intensity order, before-after order, top-bottom order, or left-right order.

136. (Previously Presented) A method according to claim 127, wherein each filter of the set of filters is a time delayed Gaussian filter having a half-width parameter α which determines the amount of the string that is sampled.

137. (Previously Presented) A method according to claim 127, wherein each filter of the set of filters is a time delayed Gaussian filter having a delay parameter $\frac{\sqrt{N}}{\alpha}$ which corresponds to a time point.

138. (Previously Presented) A method according to claim 137, wherein each Fourier series of the string is multiplied by the Fourier transform of the delayed Gaussian filter represented by $e^{-\frac{1}{2}\left(v_{s\rho 0}\frac{k_\rho}{\alpha_{s\rho 0}}\right)^2} e^{-j\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}(v_{s\rho 0}k_\rho)} e^{-\frac{1}{2}\left(v_{sz 0}\frac{k_z}{\alpha_{sz 0}}\right)^2} e^{-j\frac{\sqrt{N_{sz 0}}}{\alpha_{sz 0}}(v_{sz 0}k_z)}$ wherein the filter established the correct order to form the string, wherein the ordered string is represented by:

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}N_{s,m_{\rho_0}}N_{s,m_{z_0}}e^{-\frac{1}{2}\left(v_{s\rho 0}\frac{k_\rho}{\alpha_{s\rho 0}}\right)^2}e^{-j\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}(v_{s\rho 0}k_\rho)}e^{-\frac{1}{2}\left(v_{sz0}\frac{k_z}{\alpha_{sz0}}\right)^2}e^{-j\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}(v_{sz0}k_z)}$$

$$e^{-jk_\rho\left(\rho_{fb_{s,m}}+\rho_{t_{s,m}}\right)}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{v_{s,m}t_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

wherein $v_{s\rho 0}$ and v_{sz0} are constants such as the signal propagation velocities in the ρ and z directions, respectively, $\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}$ and $\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}$ are delay parameters and $\alpha_{s\rho 0}$ and α_{sz0} are half-width parameters of a corresponding Gaussian filter in the ρ and z directions, respectively, $\rho_{t_{s,m}}=v_{t_{s,m}}t_{t_{s,m}}$ is the modulation factor which corresponds to the physical time delay $t_{t_{s,m}}$, $\rho_{fb_{s,m}}=v_{fb_{s,m}}t_{fb_{s,m}}$ is the modulation factor which corresponds to the specific transducer time delay $t_{fb_{s,m}}$, $v_{t_{s,m}}$ and $v_{fb_{s,m}}$ are constants such as the signal propagation velocities, $a_{0_{s,m}}$ is a constant, k_ρ and k_z are the frequency variables, n, m, s, M_s, and S are integers, and $N_{s,m_{\rho_0}}$, $N_{s,m_{z_0}}$, $\rho_{0_{s,m}}$, and $z_{0_{s,m}}$ are data parameters.

139. (Previously Presented) A method according to claim 138, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

140. (Previously Presented) A method according to claim 138, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

141. (Previously Presented) A method according to claim 138, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

142. (Previously Presented) A method according to claim 138, wherein $v_{s,m}t_{0_{s,m}} = \rho_{0_{s,m}}$ and $k_\rho = k_z$ such that the string in Fourier space is one dimensional in terms of k_ρ and is represented by

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty} a_{0_{s,m}} N_{s,m_{\rho_0}} e^{-\frac{1}{2}\left(v_{s\rho 0}\frac{k_\rho}{\alpha_{s\rho 0}}\right)^2} e^{-j\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}(v_{s\rho 0}k_\rho)} e^{-jk_\rho \rho_{fb_{s,m}}} \sin\left(\left(k_\rho - n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)$$

wherein $v_{s\rho_0}$ is a constant such as the signal propagation velocity in the ρ direction, $\frac{\sqrt{N_{s\rho_0}}}{\alpha_{s\rho_0}}$ is a delay parameter and $\alpha_{s\rho_0}$ is a half-width parameter of a corresponding Gaussian filter in the k_ρ-space, $\rho_{fb_{s,m}} = v_{fb_{s,m}} t_{fb_{s,m}}$ is the modulation factor which corresponds to the specific transducer time delay $t_{fb_{s,m}}$, $v_{fb_{s,m}}$ is a constant such as the signal propagation velocity, $a_{0_{s,m}}$ is a constant, k_ρ is the frequency variable, n, m, s, M_s, and S are integers, and $N_{s,m_{\rho_0}}$ and $\rho_{0_{s,m}}$ are data parameters.

143. (Previously Presented) A method according to claim 142, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

144. (Previously Presented) A method according to claim 142, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

145. (Previously Presented) A method according to claim 142, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

146. (Previously Presented) A method according to claim 127, wherein the probability expectation value is based upon Poissonian probability.

147. (Previously Presented) A method according to claim 146, wherein the probability expectation value is characterized by

$$\prod_{s}\left[p_{\uparrow_s}+\left(P-p_{\uparrow_s}\right)\exp\left[-\beta_s^{-2}\left(\frac{1-\cos 2\phi_s}{2}\right)\right]\cos\left(\delta_s+2\sin\phi_s\right)\right]$$

wherein P is the maximum probability that at least one other Fourier series is active given that a first Fourier series is active, $p_{\uparrow_s}$ is a probability of a Fourier series becoming active in the absence of coupling from at least one other active Fourier series, β_s^2 is a number that represents the amplitude of spectral similarity between at least two filtered or unfiltered Fourier series, ϕ_s represents the frequency difference angle between at least two filtered or unfiltered Fourier series, and δ_s, is a phase factor.

148. (Previously Presented) A method according to claim 147, wherein β_s^2 is characterized by

$$\beta_s^2=(8\pi)^2\frac{1}{\sqrt{2\pi}}\sqrt{\frac{\alpha_1^2\alpha_s^2}{\alpha_1^2+\alpha_s^2}}\sum_{m_1=1}^{M_1}a_{0_{m_1}}N_{m_1}\sum_{m_s=1}^{M_s}a_{0_{m_s}}N_{m_s}$$

$$\exp-\left\{\frac{\frac{\alpha_1^2\alpha_s^2}{\alpha_1^2+\alpha_s^2}\left(\frac{\sqrt{N_1}}{\alpha_1}-\frac{\sqrt{N_s}}{\alpha_s}+\left(\frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}}+\frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}}+\frac{\rho_{t_{m_1}}}{v_{t_{m_1}}}\right)-\left(\frac{N_{m_s}\rho_{0_{m_s}}}{2v_{m_s}}+\frac{\rho_{fb_{m_s}}}{v_{fb_{m_s}}}+\frac{\rho_{t_{m_s}}}{v_{t_{m_s}}}\right)\right)^2}{2}\right\}$$

wherein $\rho_{t_{m_1}}=v_{t_{m_1}}t_{t_{m_1}}$ and $\rho_{t_{m_s}}=v_{t_{m_s}}t_{t_{m_s}}$ are the modulation factors which corresponds to the physical time delays $t_{t_{m_1}}$ and $t_{t_{m_s}}$, respectively, $\rho_{fb_{m_1}}=v_{fb_{m_1}}t_{fb_{m_1}}$ and $\rho_{fb_{m_s}}=v_{fb_{m_s}}t_{fb_{m_s}}$ are the modulation factors which corresponds to the specific transducer time delay $t_{fb_{m_1}}$ and $t_{fb_{m_s}}$, respectively, $v_{t_{m_1}}$, $v_{t_{m_s}}$, $v_{fb_{m_1}}$, and $v_{fb_{m_s}}$ are constants such as the signal propagation velocities, $\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter,

respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1 and M_s are integers, $a_{0_{m_1}}$, $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data.

149. (Previously Presented) A method according to claim 148, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

150. (Previously Presented) A method according to claim 148, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

151. (Previously Presented) A method according to claim 148, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

152. (Previously Presented) A method according to claim 148, wherein ϕ_s is characterized by

$$\phi_s = \frac{\pi\left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \sum_{m_1=1}^{M_1}\left(\frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}}\right) - \sum_{m_s=1}^{M_s}\left(\frac{N_{m_s}\rho_{0_{m_s}}}{2v_{m_s}} + \frac{\rho_{fb_{m_s}}}{v_{fb_{m_s}}} + \frac{\rho_{t_{m_s}}}{v_{t_{m_s}}}\right)\right)}{\frac{\sqrt{N_1}}{\alpha_1} + \sum_{m_1=1}^{M_1}\left(\frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}}\right)}$$

wherein $\rho_{t_{m_1}} = v_{t_{m_1}} t_{t_{m_1}}$ and $\rho_{t_{m_s}} = v_{t_{m_s}} t_{t_{m_s}}$ are the modulation factors which corresponds to the physical time delays $t_{t_{m_1}}$ and $t_{t_{m_s}}$, respectively, $\rho_{fb_{m_1}} = v_{fb_{m_1}} t_{fb_{m_1}}$ and $\rho_{fb_{m_s}} = v_{fb_{m_s}} t_{fb_{m_s}}$ are the modulation factors which corresponds to the specific transducer time delay $t_{fb_{m_1}}$ and $t_{fb_{m_s}}$,

respectively, $v_{t_{m_1}}$, $v_{t_{m_s}}$, $v_{fb_{m_1}}$, and $v_{fb_{m_s}}$ are constants such as the signal propagation velocities, $\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1, and M_s are integers, $a_{0_{m_1}}$ and $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

153. (Previously Presented) A method according to claim 152, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

154. (Previously Presented) A method according to claim 152, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

155. (Previously Presented) A method according to claim 152, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

156. (Currently Amended) A computer comprising~~ a processor for recognizing a pattern in information comprising data and establishing an order formatted pattern in information, the computer comprising~~:

a processor for recognizing a pattern in information comprising data and establishing an order formatted pattern in information;

a computer memory comprising a set of initial ordered Fourier series; ~~and~~

software loaded into the memory of the computer that, when executed by the processor, causes the computer to generate:

an input layer that receives data representative of physical characteristics or representations of physical characteristics within an input context of the physical characteristics and transforms the data into a Fourier series in Fourier space wherein the input context is encoded in time as delays corresponding to modulation of the Fourier series at corresponding frequencies;

an association layer that receives a plurality of the Fourier series in Fourier space from the memory, recognizes a pattern in information represented by the Fourier series, forms a string comprising a sum of Fourier series, and stores the string in memory;

a string ordering layer that receives the string and at least one ordered Fourier series from the memory, orders the Fourier series contained in the string by establishing an order formatted pattern in information to form an ordered string, and stores the ordered string in memory; and

a predominant configuration layer that receives multiple ordered strings from the memory, forms complex ordered strings from the ordered strings, stores the complex ordered strings to the memory, and activates the components of any of the layers of the system to recognize a pattern in information and establish an order formatted pattern in information; and

a display device for displaying the recognized pattern.

157. (Currently Amended) A method of recognizing a pattern in information, the method comprising:

a.) generating, using a computer, an activation probability parameter based on a prior activation probability parameter generated based on a Fourier Series in Fourier Space and a weighting based on an activation rate of a corresponding component, wherein the activation probability parameter relates to the frequency with which the component is activated, wherein the computer does not recognize a pattern in information;

b.) storing the activation probability parameter in a memory of the computer;

c.) generating a probability operand based on the activation probability parameter;

d.) if said probability operand is a desired value, activating any component of one or more of the group consisting of an input layer, an association layer, a string ordering layer, and a predominant configuration layer, the activation being based on the activation probability parameter, wherein a pattern in information is recognized when said probability operand is said desired value;

e.) repeating steps a-d until the computer recognizes a pattern in the information.

158. (Previously Presented) A method according to claim 157, wherein said probability operand having a value selected from a set of zero and one.

159. (Previously Presented) A method according to claim 158, wherein said desired value is one.

160. (Currently Amended) A computer program product, comprising a computer-readable medium having a computer readable program code embodied therein, said computer readable program code adapted to be executed by a computer to implement a method for recognizing a pattern in information comprising data, the method comprising:

encoding data as parameters of a plurality of Fourier components in Fourier space using said computer;

adding at least two of said Fourier components together to form at least one Fourier series in Fourier space using said computer;

providing a system using said computer, wherein the system comprises distinct software components, and wherein the distinct software components comprise:

a filter for sampling at least one of said Fourier series in Fourier space to form a sampled Fourier series, wherein the sampled Fourier series in Fourier space is modulated with said filter to form a modulated Fourier series;

a spectral similarity analyzer for determining a spectral similarity between said modulated Fourier series and another Fourier series;

a probability expectation analyzer for determining a probability expectation value based on said spectral similarity; and

a probability operand generator for generating a probability operand based on said probability expectation value,

wherein the system selects a desired value for said probability operand, wherein recognition of a pattern in said information is obtained when said probability operand has said desired value.

161. (Previously Presented) A computer program product according to claim 160, wherein said data is inputted from a transducer which transduces physical data into computer readable data.

162. (Previously Presented) A computer program product according to claim 160, further comprising adding said modulated Fourier series and said another Fourier series to form a string of Fourier series in Fourier space when said probability operand has said desired value.

163. (Previously Presented) A computer program product according to claim 162, further comprising storing said string of Fourier series to a memory.

164. (Previously Presented) A computer program product according to claim 160, wherein said another Fourier series represents known information.

165. (Previously Presented) A computer program product according to claim 160, wherein said steps of adding said plurality of Fourier components together, sampling at least one of said plurality of Fourier series in Fourier space, modulating said sampled Fourier series in Fourier space, determining a spectral similarity between said modulated Fourier series and another one of said plurality of Fourier series, determining a probability expectation value, and generating a probability operand are repeated until a said probability operand has said desired value.

166. (Previously Presented) A computer program product according to claim 160, wherein said value of said probability operand is selected from a set of zero and one; and wherein said desired value is one.

167. (Previously Presented) A computer program product according to claim 160, wherein said step of encoding data further comprises modulating at least one of said Fourier components to provide an input context.

168. (Previously Presented) A computer program product according to claim 160, wherein inputted information comprises said data and an input context, said input context mapping on a one to one basis to a physical context, said physical context being a relationship between physical characteristics represented by said inputted information.

169. (Previously Presented) A computer program product according to claim 168, wherein each Fourier component of said at least one Fourier series comprises a quantized amplitude, a frequency, or a phase angle.

170. (Previously Presented) A computer program product according to claim 160, wherein said step of adding at least two Fourier components together is conducted to provide at least two Fourier series.

171. (Previously Presented) A computer program product according to claim 160, wherein said data is representative of physical characteristics and said Fourier series in Fourier space is selected from one of:

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}N_{m_{\rho_0}}N_{m_{z_0}}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_m}}\right)\frac{N_{m_{\rho_0}}\rho_{0_m}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_m}}\right)\frac{N_{m_{z_0}}z_{0_m}}{2}\right)$$

and

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}\frac{4}{\rho_{0_m}z_{0_m}}a_{0_m}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_m}}\right)\frac{N_{m_{\rho_0}}\rho_{0_m}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_m}}\right)\frac{N_{m_{z_0}}z_{0_m}}{2}\right)$$

wherein a_{0_m} is a constant, k_ρ and k_z are the frequency variables, n, m, and M are integers, and $N_{m_{\rho_0}}$, $N_{m_{z_0}}$, ρ_{0_m}, and z_{0_m} are data parameters.

172. (Previously Presented) A computer program product according to claim 171, wherein each of $N_{m_{\rho 0}}$ and $N_{m_{z0}}$ is proportional to a rate of change of said physical characteristics, and each of ρ_{0_m} and z_{0_m} is inversely proportional to an amplitude of said physical characteristics.

173. (Previously Presented) A computer program product according to claim 171, wherein each of $N_{m_{\rho 0}}$ and $N_{m_{z0}}$ is proportional to said amplitude of said physical characteristics, and each of ρ_{0_m} and z_{0_m} is inversely proportional to said rate of change of said physical characteristics.

174. (Previously Presented) A computer program product according to claim 171, wherein each of $N_{m_{\rho 0}}$ and $N_{m_{z0}}$ is proportional to a duration of a signal response of at least one input transducer; and each of ρ_{0_m} and z_{0_m} is inversely proportional to said physical characteristics.

175. (Previously Presented) A computer program product according to claim 167, wherein step of encoding said data further comprises encoding said input context as a characteristic time delay which corresponds to a characteristic modulation of said Fourier components or Fourier series at a frequency within a band.

176. (Previously Presented) A computer program product according to claim 175, wherein said characteristic modulation frequency band represents said input context according to at least one of a transducer, a specific transducer element, and at least one of fundamental relationship including a physical context, a temporal order, a cause and effect relationships including a temporal order, a size order, an intensity order, a before-and-after order, a top-and-bottom order, and a left-and-right order.

177. (Previously Presented) A computer program product according to claim 176, wherein said transducer has n levels of subcomponents, and is assigned a master time interval with n+1 sub time intervals in a hierarchical manner corresponding to said n levels of the transducer subcomponents, and wherein a data stream from a n^{th} level subcomponent of said

transducer is recorded as a function of time in the n+1 sub time intervals, each of said n+1 time intervals representing a time delay that corresponds to said characteristic modulation frequency band representing said input context.

178. (Previously Presented) A computer program product according to claim 177, wherein the input context is based on the identity of the specific transducer and transducer subcomponents.

179. (Previously Presented) A computer program product according to claim 177, wherein the characteristic modulation having a frequency within the band in Fourier space is represented by $e^{-j2\pi f t_0}$ which corresponds to the time delay $\delta(t - t_0)$ wherein f is the frequency variable, t is the time variable, and t_0 is the time delay.

180. (Previously Presented) A computer program product according to claim 179, wherein the step of adding at least two Fourier components together further comprises storing the characteristic modulation frequency in a distinct memory location within the band encoded as a delay in time.

181. (Previously Presented) A computer program product according to claim 179, wherein the Fourier series in Fourier space, has a characteristic modulation having a frequency within the band represented by $e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}$ and is selected from one of:

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}N_{m_{\rho_0}}N_{m_{z_0}}e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}\sin\left(k_\rho\frac{N_{m_{\rho0}}\rho_{0_m}}{2}-n\frac{2\pi N_{m_{\rho0}}}{2}\right)\sin\left(k_z\frac{N_{m_{z0}}z_{0_m}}{2}-n\frac{2\pi N_{m_{z0}}}{2}\right)$$

and

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}\frac{4}{\rho_{0_m}z_{0_m}}e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}\sin\left(k_\rho\frac{N_{m_{\rho0}}\rho_{0_m}}{2}-n\frac{2\pi N_{m_{\rho0}}}{2}\right)\sin\left(k_z\frac{N_{m_{z0}}z_{0_m}}{2}-n\frac{2\pi N_{m_{z0}}}{2}\right)$$

wherein $\rho_{t_m} = v_{t_m}t_{t_m}$ is the modulation factor which corresponds to the physical time delay t_{t_m}, $\rho_{fb_m} = v_{fb_m}t_{fb_m}$ is the modulation factor which corresponds to the specific transducer

time delay t_{fb_m}, v_{t_m} and v_{fb_m} are constants such as the signal propagation velocities, a_{0_m} is a constant, k_ρ and k_z are the frequency variables, n, m, and M are integers, and $N_{m_{\rho_0}}$, $N_{m_{z_0}}$, ρ_{0_m}, and z_{0_m} are data parameters.

182. (Previously Presented) A computer program product according to claim 181, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

183. (Previously Presented) A computer program product according to claim 181, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

184. (Previously Presented) A computer program product according to claim 181, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

185. (Previously Presented) A computer program product according to claim 179, wherein the string has a characteristic modulation having a frequency within the band represented by $e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}$ is selected from one of:

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}N_{s,m_{\rho_0}}N_{s,m_{z_0}}e^{-jk_\rho\left(\rho_{fb_{s,m}}+\rho_{t_{s,m}}\right)}$$

$$\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

and

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}\frac{4}{\rho_{0_{s,m}}z_{0_{s,m}}}e^{-jk_\rho\left(\rho_{fb_{s,m}}+\rho_{t_{s,m}}\right)}$$

$$\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

wherein $\rho_{t_{s,m}} = v_{t_{s,m}}t_{t_{s,m}}$ is the modulation factor which corresponds to the physical time delay $t_{t_{s,m}}$, $\rho_{fb_{s,m}} = v_{fb_{s,m}}t_{fb_{s,m}}$ is the modulation factor which corresponds to the specific transducer time delay $t_{fb_{s,m}}$, $v_{t_{s,m}}$ and $v_{fb_{s,m}}$ are constants such as the signal propagation velocities, $a_{0_{s,m}}$ is a constant, k_ρ and k_z are the frequency variables, n, m, s, M_s, and S are integers, and $N_{s,m_{\rho_0}}$, $N_{s,m_{z_0}}$, $\rho_{0_{s,m}}$, and $z_{0_{s,m}}$ are data parameters.

186. (Previously Presented) A computer program product according to claim 185, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

187. (Previously Presented) A computer program product according to claim 185, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

188. (Previously Presented) A computer program product according to claim 185, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

189. (Previously Presented) A computer program product according to claim 179, wherein the Fourier series in Fourier space, has a characteristic modulation having a frequency within the band represented by $e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}$ and is selected from one of:

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}N_{m_{\rho_0}}N_{m_{z_0}}e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}\sin\left(k_\rho\frac{N_{m_{\rho_0}}\rho_{0_m}}{2}-n\frac{2\pi N_{m_{\rho_0}}}{2}\right)\sin\left(k_z\frac{N_{m_{z_0}}z_{0_m}}{2}-n\frac{2\pi N_{m_{z_0}}}{2}\right)$$

and

$$\sum_{m=1}^{M}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_m}\frac{4}{\rho_{0_m}z_{0_m}}e^{-jk_\rho(\rho_{fb_m}+\rho_{t_m})}\sin\left(k_\rho\frac{N_{m_{\rho_0}}\rho_{0_m}}{2}-n\frac{2\pi N_{m_{\rho_0}}}{2}\right)\sin\left(k_z\frac{N_{m_{z_0}}z_{0_m}}{2}-n\frac{2\pi N_{m_{z_0}}}{2}\right)$$

wherein $\rho_{t_m}=v_{t_m}t_{t_m}$ is the modulation factor which corresponds to the physical time delay t_{t_m}, $\rho_{fb_m}=v_{fb_m}t_{fb_m}$ is the modulation factor which corresponds to the specific transducer time delay t_{fb_m}, v_{t_m} and v_{fb_m} are constants such as the signal propagation velocities, a_{0_m} is a constant, k_ρ and k_z are the frequency variables, n, m, and M are integers, and $N_{m_{\rho_0}}$, $N_{m_{z_0}}$, ρ_{0_m}, and z_{0_m} are data parameters.

190. (Previously Presented) A computer program product according to claim 189, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

191. (Previously Presented) A computer program product according to claim 189, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

192. (Previously Presented) A computer program product according to claim 189, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

193. (Previously Presented) A computer program product according to claim 189, wherein each Fourier series of the string is multiplied by the Fourier transform of the delayed Gaussian filter represented by $e^{-\frac{1}{2}\left(v_{s\rho 0}\frac{k_\rho}{\alpha_{s\rho 0}}\right)^2} e^{-j\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}(v_{s\rho 0}k_\rho)} e^{-\frac{1}{2}\left(v_{sz0}\frac{k_z}{\alpha_{sz0}}\right)^2} e^{-j\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}(v_{sz0}k_z)}$ wherein the filter established the association to form the string, wherein the string is represented by:

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}N_{s,m_{\rho_0}}N_{s,m_{z_0}}e^{-\frac{1}{2}\left(v_{s\rho 0}\frac{k_\rho}{\alpha_{s\rho 0}}\right)^2} e^{-j\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}(v_{s\rho 0}k_\rho)} e^{-\frac{1}{2}\left(v_{sz0}\frac{k_z}{\alpha_{sz0}}\right)^2} e^{-j\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}(v_{sz0}k_z)}$$

$$e^{-jk_\rho\left(\rho_{fb_{s,m}}+\rho_{t_{s,m}}\right)}\sin\left(\left(k_\rho - n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z - n\frac{2\pi}{v_{s,m}t_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

wherein $v_{s\rho 0}$ and v_{sz0} are constants such as the signal propagation velocities in the ρ and z directions, respectively, $\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}$ and $\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}$ are delay parameters and $\alpha_{s\rho 0}$ and α_{sz0} are half-width parameters of a corresponding Gaussian filter in the ρ and z directions, respectively, $\rho_{t_{s,m}} = v_{t_{s,m}}t_{t_{s,m}}$ is the modulation factor which corresponds to the physical time delay $t_{t_{s,m}}$, $\rho_{fb_{s,m}} = v_{fb_{s,m}}t_{fb_{s,m}}$ is the modulation factor which corresponds to the specific transducer time delay $t_{fb_{s,m}}$, $v_{t_{s,m}}$ and $v_{fb_{s,m}}$ are constants such as the signal propagation velocities, $a_{0_{s,m}}$ is a

constant, k_ρ and k_z are the frequency variables, n, m, s, M_s, and S are integers, and $N_{s,m_{\rho_0}}$, $N_{s,m_{z_0}}$, $\rho_{0_{s,m}}$, and $z_{0_{s,m}}$ are data parameters.

194. (Previously Presented) A computer program product according to claim 193, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

195. (Previously Presented) A computer program product according to claim 193, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

196. (Previously Presented) A computer program product according to claim 193, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

197. (Previously Presented) A computer program product according to claim 160, wherein the step of adding at least two of said Fourier components together further comprises creating transducer strings by obtaining a Fourier series from at least two selected transducers and adding the Fourier series.

198. (Previously Presented) A computer program product according to claim 197, further comprises selecting transducers that are active simultaneously.

199. (Previously Presented) A computer program product according to claim 198, wherein the transducer string is stored in a distinct memory location wherein a characteristic modulation having a frequency within the band in Fourier space is represented by $e^{-j2\pi f t_0}$ which corresponds to the time delay $\delta(t - t_0)$ wherein f is the frequency variable, t is the time variable, and t_0 is the time delay.

200. (Previously Presented) A computer program product according to claim 199, wherein the step of adding at least two of said Fourier components together further comprises recalling any part of the transducer string from the distinct memory location which thereby causes additional Fourier series of the transducer string to be recalled.

201. (Previously Presented) A computer program product according to claim 160, wherein the filter is a time delayed Gaussian filter in the time domain.

202. (Previously Presented) A computer program product according to claim 201, wherein the Gaussian filter comprises a plurality of cascaded stages each stage having a decaying exponential system function between stages.

203. (Previously Presented) A computer program product according to claim 201, wherein the Gaussian filter is modulated in the time domain to produce a frequency shift of the sampling and modulation in the frequency domain.

204. (Previously Presented) A computer program product according to claim 201, wherein the filter is characterized in time by:

$$\frac{\alpha}{\sqrt{2\pi}} e^{-\frac{\left(t-\frac{\sqrt{N}}{\alpha}\right)^2}{\frac{2}{\alpha^2}}}$$

wherein $\frac{\sqrt{N}}{\alpha}$ is a delay parameter, α is a half-width parameter, and t is the time parameter.

205. (Previously Presented) A computer program product according to claim 201, wherein the filter, in frequency space, is characterized by:

$$e^{-\frac{1}{2}\left(\frac{2\pi f}{\alpha}\right)^2} e^{-j\sqrt{N}\left(\frac{2\pi f}{\alpha}\right)}$$

wherein $\frac{\sqrt{N}}{\alpha}$ and α are a corresponding delay parameter and a half-width parameter in time, respectively, and f is the frequency parameter.

206. (Previously Presented) A computer program product according to claim 160, wherein the probability expectation value is based upon Poissonian probability.

207. (Previously Presented) A computer program product according to claim 206, wherein the probability expectation value is characterized by

$$\prod_s \left[p_{\uparrow_s} + \left(P - p_{\uparrow_s}\right) \exp\left[-\beta_s^{-2} \left(\frac{1 - \cos 2\phi_s}{2} \right) \right] \cos\left(\delta_s + 2\sin\phi_s\right) \right]$$

wherein P is the maximum probability of at least one other Fourier series being associated with a first Fourier series, $p_{\uparrow_s}$ is a probability of at least one other Fourier series being associated with a first Fourier series in the absence of coupling of the first Fourier series with the at least one other Fourier series, β_s^2 is a number that represents the amplitude of spectral similarity between at least two filtered or unfiltered Fourier series, ϕ_s represents the frequency difference angle between at least two filtered or unfiltered Fourier series, and δ_s, is a phase factor.

208. (Previously Presented) A computer program product according to claim 207, wherein β_s^2 is characterized by

$$\beta_s^2 = (8\pi)^2 \frac{1}{\sqrt{2\pi}} \sqrt{\frac{\alpha_1^2 \alpha_s^2}{\alpha_1^2 + \alpha_s^2}}$$

$$\sum_{m_1=1}^{M_1} a_{0_{m_1}} N_{m_1} \sum_{m_s=1}^{M_s} a_{0_{m_s}} N_{m_s} \exp - \left\{ \frac{\frac{\alpha_1^2 \alpha_s^2}{\alpha_1^2 + \alpha_s^2} \left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \frac{N_{m_1} \rho_{0_{m_1}}}{2v_{m_1}} - \frac{N_{m_s} \rho_{0_{m_s}}}{2v_{m_s}} \right)^2}{2} \right\}$$

$\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1 and M_s are integers, $a_{0_{m_1}}$ and $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

209. (Previously Presented) A computer program product according to claim 208, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

210. (Previously Presented) A computer program product according to claim 208, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

211. (Previously Presented) A computer program product according to claim 208, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

212. (Previously Presented) A computer program product according to claim 208, wherein ϕ_s is characterized by

$$\phi_s = \frac{\pi\left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \sum_{m_1=1}^{M_1} \frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} - \sum_{m_s=1}^{M_s} \frac{N_{m_s}\rho_{0_{m_s}}}{2v_{m_s}}\right)}{\frac{\sqrt{N_1}}{\alpha_1} + \sum_{m_1=1}^{M_1} \frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}}}$$

$\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1 and M_s are integers, $a_{0_{m_1}}$ and $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

213. (Previously Presented) A computer program product according to claim 212, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

214. (Previously Presented) A computer program product according to claim 212, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

215. (Previously Presented) A computer program product according to claim 212, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

216. (Previously Presented) A computer program product according to claim 208, wherein β_s^2 is characterized by

$$\beta_s^2 = (8\pi)^2 \frac{1}{\sqrt{2\pi}} \sqrt{\frac{\alpha_1^2 \alpha_s^2}{\alpha_1^2 + \alpha_s^2}} \sum_{m_1=1}^{M_1} a_{0_{m_1}} N_{m_1} \sum_{m_s=1}^{M_s} a_{0_{m_s}} N_{m_s}$$

$$\exp - \left\{ \frac{\frac{\alpha_1^2 \alpha_s^2}{\alpha_1^2 + \alpha_s^2} \left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \left(\frac{N_{m_1} \rho_{0_{m_1}}}{2 v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}} \right) - \left(\frac{N_{m_s} \rho_{0_{m_s}}}{2 v_{m_s}} + \frac{\rho_{fb_{m_s}}}{v_{fb_{m_s}}} + \frac{\rho_{t_{m_s}}}{v_{t_{m_s}}} \right) \right)^2}{2} \right\}$$

wherein $\rho_{t_{m_1}} = v_{t_{m_1}} t_{t_{m_1}}$ and $\rho_{t_{m_s}} = v_{t_{m_s}} t_{t_{m_s}}$ are the modulation factors which corresponds to the physical time delays $t_{t_{m_1}}$ and $t_{t_{m_s}}$, respectively, $\rho_{fb_{m_1}} = v_{fb_{m_1}} t_{fb_{m_1}}$ and $\rho_{fb_{m_s}} = v_{fb_{m_s}} t_{fb_{m_s}}$ are the modulation factors which corresponds to the specific transducer time delay $t_{fb_{m_1}}$ and $t_{fb_{m_s}}$, respectively, $v_{t_{m_1}}$, $v_{t_{m_s}}$, $v_{fb_{m_1}}$, and $v_{fb_{m_s}}$ are constants such as the signal propagation velocities, $\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1 and M_s are integers, $a_{0_{m_1}}$, $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

217. (Previously Presented) A computer program product according to claim 216, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

218. (Previously Presented) A computer program product according to claim 216, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is

proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

219. (Previously Presented) A computer program product according to claim 216, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

220. (Previously Presented) A computer program product according to claim 208, wherein ϕ_s is characterized by

$$\phi_s = \frac{\pi\left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \sum_{m_1=1}^{M_1}\left(\frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}}\right) - \sum_{m_s=1}^{M_s}\left(\frac{N_{m_s}\rho_{0_{m_s}}}{2v_{m_s}} + \frac{\rho_{fb_{m_s}}}{v_{fb_{m_s}}} + \frac{\rho_{t_{m_s}}}{v_{t_{m_s}}}\right)\right)}{\frac{\sqrt{N_1}}{\alpha_1} + \sum_{m_1=1}^{M_1}\left(\frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}}\right)}$$

wherein $\rho_{t_{m_1}} = v_{t_{m_1}} t_{t_{m_1}}$ and $\rho_{t_{m_s}} = v_{t_{m_s}} t_{t_{m_s}}$ are the modulation factors which corresponds to the physical time delays $t_{t_{m_1}}$ and $t_{t_{m_s}}$, respectively, $\rho_{fb_{m_1}} = v_{fb_{m_1}} t_{fb_{m_1}}$ and $\rho_{fb_{m_s}} = v_{fb_{m_s}} t_{fb_{m_s}}$ are the modulation factors which corresponds to the specific transducer time delay $t_{fb_{m_1}}$ and $t_{fb_{m_s}}$, respectively, $v_{t_{m_1}}$, $v_{t_{m_s}}$, $v_{fb_{m_1}}$, and $v_{fb_{m_s}}$ are constants such as the signal propagation velocities, $\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1, and M_s are integers, $a_{0_{m_1}}$ and $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

221. (Previously Presented) A computer program product according to claim 220, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

222. (Previously Presented) A computer program product according to claim 220, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

223. (Previously Presented) A computer program product according to claim 220, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

224. (Previously Presented) A computer program product according to claim 160, further comprising linking at least two Fourier series stored in a memory comprising the steps of

a.) generating a probability expectation value that recalling any part of one of the Fourier series from the memory causes at least another Fourier series to be recalled from the memory;

b.) storing the probability expectation value to memory;

c.) generating a probability operand based on the probability expectation value, and

d.) recalling the at least another Fourier series from the memory if the operand has a desired value.

225. (Previously Presented) A computer program product according to claim 224, wherein said probability operand is a value selected from a set of zero and one.

226. (Previously Presented) A computer program product according to claim 225, wherein said desired value is one.

227. (Previously Presented) A computer program product according to claim 160, whereby the probability expectation value increases with a rate of recalling any part of any of the Fourier series.

228. (Currently Amended) A computer-readable medium on which is stored a computer program for providing a method for recognizing a pattern in information, the computer program comprising instructions which, when executed by a computer comprising a processor, cause the processor to:

represent the information as a plurality of Fourier series in Fourier space, wherein the information is representative of one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest;

form associations, using the computer, between at least two of the Fourier series by modulating and sampling the Fourier series with filters and by coupling the filtered Fourier series based on a probability distribution, wherein when at least two of the Fourier series have been associated recognition of a pattern in the information is achieved; and

store the at least two of the Fourier series that have been associated in a memory.

229. (Previously Presented) A computer-readable according to claim 228, wherein coupling is based on spectral similarity of said Fourier series.

230. (Previously Presented) A computer-readable according to claim 228, further comprising adding the associated Fourier series to form a string, and ordering the string.

231. (Previously Presented) A computer-readable according to claim 228, wherein the filter is a time delayed Gaussian filter in the time domain.

232. (Previously Presented) A computer-readable according to claim 228, wherein the probability distribution is Poissonian.

233. (Previously Presented) A computer-readable according to claim 230, wherein the string is selected from one of:

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}N_{s,m_{\rho_0}}N_{s,m_{z_0}}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

and

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}\frac{4}{\rho_{0_{s,m}}z_{0_{s,m}}}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{z_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

wherein $a_{0_{s,m}}$ is a constant, k_ρ and k_z are the frequency variables, n, m, s, M_s, and S are integers, and $N_{s,m_{\rho_0}}$, $N_{s,m_{z_0}}$, $\rho_{0_{s,m}}$, and $z_{0_{s,m}}$ are data parameters.

234. (Previously Presented) A computer-readable according to claim 233, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

235. (Previously Presented) A computer-readable according to claim 233, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

236. (Previously Presented) A computer-readable according to claim 233, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

237. (Currently Amended) A computer-readable medium on which is stored a computer program for providing a method for recognizing a pattern in information and establishing an order formatted pattern in information with respect to standard ordered information, the computer program comprising instructions which, when executed by a computer, perform the steps of:

a.) obtaining, using the computer, a string comprising a sum of Fourier series from a memory, said string representing information, said information representative of one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest;

b.) selecting, using the computer, at least two filters from a selected set of filters;

c.) sampling, using the computer, the string with the filters such that each of the filters produces a sampled Fourier series, each Fourier series comprising a subset of the string;

d.) modulating, using the computer, each of the sampled Fourier series in Fourier space with the corresponding selected filter such that each filter produces an order formatted Fourier series;

e.) adding, using the computer, the order formatted Fourier series produced by each filter to form a summed Fourier series in Fourier space;

f.) obtaining, using the computer, an ordered Fourier series from the memory;

g.) determining, using the computer, a spectral similarity between the summed Fourier series and the ordered Fourier series;

h.) determining, using the computer, a probability expectation value based on the spectral similarity;

i.) generating, using the computer, a probability operand based on the probability expectation value;

j.) repeating steps b-i until the probability operand has a desired value, when the probability operand has a desired value a pattern in information has been recognized and an order formatted pattern in the information has been established;

k.) storing the summed Fourier series to an intermediate memory;

l.) removing the selected filters from the selected set of filters to form an updated set of filters;

m.) removing the subsets from the string to obtain an updated string;

n.) selecting an updated filter from the updated set of filters;

o.) sampling the updated string with the updated filter to form a sampled Fourier series comprising a subset of the string;

p.) modulating the sampled Fourier series in Fourier space with the corresponding selected updated filter to form an updated order formatted Fourier series;

q.) recalling the summed Fourier series from the intermediate memory;

r.) adding the updated order formatted Fourier series to the summed Fourier series from the intermediate memory to form an updated summed Fourier series in Fourier space;

s.) obtaining an updated ordered Fourier series from the high level memory;

t.) determining a spectral similarity between the updated summed Fourier series and the updated ordered Fourier series;

u.) determining a probability expectation value based on the spectral similarity;

v.) generating a probability operand based on the probability expectation value;

w.) repeating steps n-v until the probability operand has a desired value or all of the updated filters have been selected from the updated set of filters, when the probability operand has a desired value a pattern in information has been recognized and an order formatted pattern in the information has been established;

x.) if all of the updated filters have been selected before the probability operand has a desired value, then clearing the intermediate memory and returning to step b;

y.) if the probability operand has a desired value, then storing the updated summed Fourier series to the intermediate memory;

z.) repeating steps l-y until one of the following set of conditions is satisfied: the updated set of filters is empty, or the remaining subsets of the string of step m.) is nil; and

aa.) storing the Fourier series in the intermediate memory in the high level memory.

238. (Previously Presented) A computer-readable medium according to claim 237, wherein information is represented by a sum of Fourier series in Fourier space.

239. (Previously Presented) A computer-readable medium according to claim 237, further comprising encoding data which includes modulating at least one of said Fourier components to provide an input context.

240. (Previously Presented) A computer-readable according to claim 237, wherein inputted information comprises data and an input context, said input context mapping on a one to one basis to a physical context, said physical context being a relationship between physical characteristics represented by said inputted information.

241. (Previously Presented) A computer-readable medium according to claim 237, wherein each Fourier component of said at least one Fourier series comprises a quantized amplitude, a frequency, or a phase angle.

242. (Previously Presented) A computer-readable medium according to claim 237, wherein said probability operands having a value selected from a set of zero and one.

243. (Previously Presented) A computer-readable medium to claim 242, wherein said desired values are one.

244. (Previously Presented) A computer-readable medium to claim 237, wherein the high level memory is initialized with standard inputs.

245. (Previously Presented) A computer-readable medium to claim 237, wherein the ordering is according to one of the list of: temporal order, cause and effect relationships, size order, intensity order, before-after order, top-bottom order, or left-right order.

246. (Previously Presented) A computer-readable medium to claim 237, wherein each filter of the set of filters is a time delayed Gaussian filter having a half-width parameter α which determines the amount of the string that is sampled.

247. (Previously Presented) A computer-readable medium to claim 237, wherein each filter of the set of filters is a time delayed Gaussian filter having a delay parameter $\frac{\sqrt{N}}{\alpha}$ which corresponds to a time point.

248. (Previously Presented) A computer-readable medium to claim 247, wherein each Fourier series of the string is multiplied by the Fourier transform of the delayed Gaussian filter represented by $e^{-\frac{1}{2}\left(v_{s\rho 0}\frac{k_\rho}{\alpha_{s\rho 0}}\right)^2} e^{-j\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}(v_{s\rho 0}k_\rho)} e^{-\frac{1}{2}\left(v_{sz0}\frac{k_z}{\alpha_{sz0}}\right)^2} e^{-j\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}(v_{sz0}k_z)}$ wherein the filter established the correct order to form the string, wherein the ordered string is represented by:

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty}\frac{4\pi}{1+\frac{k_z^2}{k_\rho^2}}a_{0_{s,m}}N_{s,m_{\rho_0}}N_{s,m_{z_0}}e^{-\frac{1}{2}\left(v_{s\rho 0}\frac{k_\rho}{\alpha_{s\rho 0}}\right)^2} e^{-j\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}(v_{s\rho 0}k_\rho)} e^{-\frac{1}{2}\left(v_{sz0}\frac{k_z}{\alpha_{sz0}}\right)^2} e^{-j\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}(v_{sz0}k_z)}$$

$$e^{-jk_\rho\left(\rho_{fb_{s,m}}+\rho_{t_{s,m}}\right)}\sin\left(\left(k_\rho-n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)\sin\left(\left(k_z-n\frac{2\pi}{v_{s,m}t_{0_{s,m}}}\right)\frac{N_{s,m_{z_0}}z_{0_{s,m}}}{2}\right)$$

wherein $v_{s\rho 0}$ and v_{sz0} are constants such as the signal propagation velocities in the ρ and z directions, respectively, $\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}$ and $\frac{\sqrt{N_{sz0}}}{\alpha_{sz0}}$ are delay parameters and $\alpha_{s\rho 0}$ and α_{sz0} are half-width parameters of a corresponding Gaussian filter in the ρ and z directions, respectively, $\rho_{t_{s,m}}=v_{t_{s,m}}t_{t_{s,m}}$ is the modulation factor which corresponds to the physical time delay $t_{t_{s,m}}$, $\rho_{fb_{s,m}}=v_{fb_{s,m}}t_{fb_{s,m}}$ is the modulation factor which corresponds to the specific transducer time delay $t_{fb_{s,m}}$, $v_{t_{s,m}}$ and $v_{fb_{s,m}}$ are constants such as the signal propagation velocities, $a_{0_{s,m}}$ is a constant, k_ρ and k_z are the frequency variables, n, m, s, M_s, and S are integers, and $N_{s,m_{\rho_0}}$, $N_{s,m_{z_0}}$, $\rho_{0_{s,m}}$, and $z_{0_{s,m}}$ are data parameters.

249. (Previously Presented) A computer-readable medium to claim 248, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

250. (Previously Presented) A computer-readable medium to claim 248, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

251. (Previously Presented) A computer-readable medium to claim 248, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

252. (Previously Presented) A computer-readable medium to claim 248, wherein $v_{s,m}t_{0_{s,m}} = \rho_{0_{s,m}}$ and $k_\rho = k_z$ such that the string in Fourier space is one dimensional in terms of k_ρ and is represented by

$$\sum_{s=1}^{S}\sum_{m=1}^{M_s}\sum_{n=-\infty}^{\infty} a_{0_{s,m}} N_{s,m_{\rho_0}} e^{-\frac{1}{2}\left(v_{s\rho 0}\frac{k_\rho}{\alpha_{s\rho 0}}\right)^2} e^{-j\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}(v_{s\rho 0}k_\rho)} e^{-jk_\rho \rho_{fb_{s,m}}} \sin\left(\left(k_\rho - n\frac{2\pi}{\rho_{0_{s,m}}}\right)\frac{N_{s,m_{\rho_0}}\rho_{0_{s,m}}}{2}\right)$$

wherein $v_{s\rho 0}$ is a constant such as the signal propagation velocity in the ρ direction, $\frac{\sqrt{N_{s\rho 0}}}{\alpha_{s\rho 0}}$ is a delay parameter and $\alpha_{s\rho 0}$ is a half-width parameter of a corresponding Gaussian filter in the k_ρ-space, $\rho_{fb_{s,m}} = v_{fb_{s,m}} t_{fb_{s,m}}$ is the modulation factor which corresponds to the specific transducer time delay $t_{fb_{s,m}}$, $v_{fb_{s,m}}$ is a constant such as the signal propagation velocity, $a_{0_{s,m}}$ is a constant, k_ρ is the frequency variable, n, m, s, M_s, and S are integers, and $N_{s,m_{\rho_0}}$ and $\rho_{0_{s,m}}$ are data parameters.

253. (Previously Presented) A computer-readable medium to claim 252, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

254. (Previously Presented) A computer-readable medium to claim 252, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

255. (Previously Presented) A computer-readable medium to claim 252, wherein each of the data parameters $N_{m\rho_0}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

256. (Previously Presented) A computer-readable medium to claim 237, wherein the probability expectation value is based upon Poissonian probability.

257. (Previously Presented) A computer-readable medium to claim 256, wherein the probability expectation value is characterized by

$$\prod_s \left[p_{\uparrow_s} + \left(P - p_{\uparrow_s}\right) \exp\left[-\beta_s^{-2} \left(\frac{1 - \cos 2\phi_s}{2} \right) \right] \cos\left(\delta_s + 2\sin\phi_s\right) \right]$$

wherein P is the maximum probability that at least one other Fourier series is active given that a first Fourier series is active, $p_{\uparrow_s}$ is a probability of a Fourier series becoming active in the absence of coupling from at least one other active Fourier series, β_s^2 is a number that represents the amplitude of spectral similarity between at least two filtered or unfiltered Fourier series, ϕ_s represents the frequency difference angle between at least two filtered or unfiltered Fourier series, and δ_s, is a phase factor.

258. (Previously Presented) A computer-readable medium to claim 257, wherein β_s^2 is characterized by

$$\beta_s^2 = (8\pi)^2 \frac{1}{\sqrt{2\pi}} \sqrt{\frac{\alpha_1^2 \alpha_s^2}{\alpha_1^2 + \alpha_s^2}} \sum_{m_1=1}^{M_1} a_{0_{m_1}} N_{m_1} \sum_{m_s=1}^{M_s} a_{0_{m_s}} N_{m_s}$$

$$\exp - \left\{ \frac{ \frac{\alpha_1^2 \alpha_s^2}{\alpha_1^2 + \alpha_s^2} \left(\left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \left(\frac{N_{m_1} \rho_{0_{m_1}}}{2 v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}} \right) - \left(\frac{N_{m_s} \rho_{0_{m_s}}}{2 v_{m_s}} + \frac{\rho_{fb_{m_s}}}{v_{fb_{m_s}}} + \frac{\rho_{t_{m_s}}}{v_{t_{m_s}}} \right) \right) \right)^2 }{2} \right\}$$

wherein $\rho_{t_{m_1}} = v_{t_{m_1}} t_{t_{m_1}}$ and $\rho_{t_{m_s}} = v_{t_{m_s}} t_{t_{m_s}}$ are the modulation factors which corresponds to the physical time delays $t_{t_{m_1}}$ and $t_{t_{m_s}}$, respectively, $\rho_{fb_{m_1}} = v_{fb_{m_1}} t_{fb_{m_1}}$ and $\rho_{fb_{m_s}} = v_{fb_{m_s}} t_{fb_{m_s}}$ are the modulation factors which corresponds to the specific transducer time delay $t_{fb_{m_1}}$ and $t_{fb_{m_s}}$, respectively, $v_{t_{m_1}}$, $v_{t_{m_s}}$, $v_{fb_{m_1}}$, and $v_{fb_{m_s}}$ are constants such as the signal propagation velocities, $\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1 and M_s are integers, $a_{0_{m_1}}$, $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

259. (Previously Presented) A computer-readable medium to claim 258, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

260. (Previously Presented) A computer-readable medium to claim 258, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

261. (Previously Presented) A computer-readable medium to claim 258, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

262. (Previously Presented) A computer-readable medium to claim 258, wherein ϕ_s is characterized by

$$\phi_s = \frac{\pi\left(\frac{\sqrt{N_1}}{\alpha_1} - \frac{\sqrt{N_s}}{\alpha_s} + \sum_{m_1=1}^{M_1}\left(\frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}}\right) - \sum_{m_s=1}^{M_s}\left(\frac{N_{m_s}\rho_{0_{m_s}}}{2v_{m_s}} + \frac{\rho_{fb_{m_s}}}{v_{fb_{m_s}}} + \frac{\rho_{t_{m_s}}}{v_{t_{m_s}}}\right)\right)}{\frac{\sqrt{N_1}}{\alpha_1} + \sum_{m_1=1}^{M_1}\left(\frac{N_{m_1}\rho_{0_{m_1}}}{2v_{m_1}} + \frac{\rho_{fb_{m_1}}}{v_{fb_{m_1}}} + \frac{\rho_{t_{m_1}}}{v_{t_{m_1}}}\right)}$$

wherein $\rho_{t_{m_1}} = v_{t_{m_1}} t_{t_{m_1}}$ and $\rho_{t_{m_s}} = v_{t_{m_s}} t_{t_{m_s}}$ are the modulation factors which corresponds to the physical time delays $t_{t_{m_1}}$ and $t_{t_{m_s}}$, respectively, $\rho_{fb_{m_1}} = v_{fb_{m_1}} t_{fb_{m_1}}$ and $\rho_{fb_{m_s}} = v_{fb_{m_s}} t_{fb_{m_s}}$ are the modulation factors which corresponds to the specific transducer time delay $t_{fb_{m_1}}$ and $t_{fb_{m_s}}$, respectively, $v_{t_{m_1}}$, $v_{t_{m_s}}$, $v_{fb_{m_1}}$, and $v_{fb_{m_s}}$ are constants such as the signal propagation velocities, $\frac{\sqrt{N_1}}{\alpha_1}$ and $\frac{\sqrt{N_s}}{\alpha_s}$ correspond to delay parameters of a first and s-th time delayed Gaussian filter, respectively, α_1 and α_s corresponding half-width parameters of a first and s-th time delayed Gaussian filter, respectively, M_1, and M_s are integers, $a_{0_{m_1}}$ and $a_{0_{m_s}}$ are constants, v_{m_1} and v_{m_s} are constants such as the signal propagation velocities, and N_{m_1}, N_{m_s}, $\rho_{0_{m_1}}$, and $\rho_{0_{m_s}}$ are data parameters.

263. (Previously Presented) A computer-readable medium to claim 262, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the rate of change of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the amplitude of the physical characteristic.

264. (Previously Presented) A computer-readable medium to claim 262, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the amplitude of the physical characteristic and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the rate of change of the physical characteristic.

265. (Previously Presented) A computer-readable medium to claim 262, wherein each of the data parameters $N_{m_{\rho_0}}$ and $N_{m_{z_0}}$ of the Fourier series component is proportional to the

duration of a signal response of each transducer and each of the data parameters ρ_{0_m} and z_{0_m} of each Fourier component is inversely proportional to the physical characteristic.

266. (Currently Amended) A computer-readable medium on which is stored a computer program for providing a method for recognizing a pattern in information and establishing an order formatted pattern in information, the computer program comprising instructions which, when executed by a computer, perform the steps of:

a.) recording ordered strings comprising Fourier series in Fourier Space to a high level memory, said Fourier series representing information, said information representative of one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest;

b.) forming association between Fourier series of the ordered strings to form complex strings and recognizing a pattern in information;

c.) ordering the Fourier series of the complex strings to form complex ordered strings representing recognized information and establishing an order formatted pattern in information;

d.) storing the complex ordered strings to the high level memory; and

e.) displaying the pattern in the information on a display device of the computer.

267. (Currently Amended) A computer-readable medium on which is stored a computer program for providing a method for recognizing a pattern in information comprising data and forming a predominant configuration, the computer program comprising instructions which, when executed by a computer, perform the steps of:

a.) accepting an input at the computer from one or more components representative of the current activation rates of the one or more components and one or more prior activation probability parameters generated based on a Fourier Series in Fourier Space;

b.) generating an activation probability parameter using the computer based on a prior activation probability parameter and a weighting based on an activation rate of the corresponding component;

c.) storing the activation probability parameter in memory;

d.) generating a probability operand based on the activation probability parameter using the computer;

e.) if said probability operand is a desired value, activating, using the computer, any component of one or more of the group consisting of an input layer, an association layer, a string ordering layer, and a predominant configuration layer, the activation being based on the activation probability parameter, wherein recognition of a pattern in information is achieved when said probability operand is said desired value, and

f.) repeating steps b-e to form a predominate configuration.

268. (Previously Presented) A method according to claim 267, wherein said probability operand having a value selected from a set of zero and one.

269. (Previously Presented) A method according to claim 268, wherein said desired value is one.

270. (Currently Amended) A computer program product for recognizing a pattern in information for use in a computer including a central processing unit and a memory, the memory maintaining a set of initial ordered Fourier series, the computer program product comprising:

a computer readable medium; ~~and~~

program code means embodied in the computer readable medium, the program code means comprising:

means for receiving data representative of physical characteristics or representations of physical characteristics within an input context of the physical characteristics from a transducer and transforming the data, using the central processing unit, into a Fourier series in Fourier space wherein the input context is encoded in time as delays corresponding to modulation of the Fourier series at corresponding frequencies;

means for receiving a plurality of the Fourier series in Fourier space including at least one ordered Fourier series from the memory, forming a string comprising a sum of the Fourier series using the central processing unit and storing the string in memory;

means for retrieving the string from memory, ordering the Fourier series contained in the string to form an ordered string using the central processing unit and storing the ordered string in memory; and

means for retrieving multiple ordered strings from the memory, forming complex ordered strings from the ordered strings using the central processing unit and storing the complex ordered strings to the memory; and

means for receiving the complex ordered strings and displaying a pattern recognized using the complex ordered strings on a display.

271. (Currently Amended) A method of recognizing a pattern in information comprising data and establishing an order formatted pattern in information, the method comprising:

receiving input data from a transducer at a computer comprising a memory, the input data related to one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest;

encoding inputted data, using the computer, as a plurality of Fourier components in Fourier Space and form a plurality of Fourier series from said Fourier components, said Fourier series representing information comprising data and input context;

associating said plurality of Fourier series with each other according to spectral similarities between said plurality of Fourier series to form a string using the computer, said string being a sum of associated plurality of Fourier series;

ordering said plurality of Fourier series within said string based on relative degree of association of order formatted subsets of said string with relevant aspects of a standard ordered string using the computer;

assigning an activation probability parameter to each of said plurality of Fourier components and to each of said plurality of Fourier series to produce a predominant configuration string using the computer, generating a probability operand based on said activation probability parameter, said probability operand determining whether an activation of any one of said plurality of Fourier component and said plurality of Fourier series is to cause an activation of an associated another of said plurality of Fourier components and said plurality of Fourier series from said ordered string; and

storing said predominant configuration string in ~~a computer~~said memory, wherein the predominant configuration string allows a pattern in newly inputted information to be recognized.

272. (Previously Presented) A method according to claim 271, wherein said step of associating said plurality of Fourier series comprises sampling and modulating at least one of said plurality of Fourier series with at least one filter.

273. (Previously Presented) A method according to claim 272, wherein said at least one filter comprises a time delayed Gaussian filter in time domain.

274. (Previously Presented) A method according to claim 271, wherein said step of ordering said plurality of Fourier series comprises sampling and modulating at least two of said plurality of Fourier series with at least two filters from a set of filters.

275. (Previously Presented) A method according to claim 274, wherein said at least two filters comprises a time delayed Gaussian filter in time domain.

276. (Previously Presented) A method according to claim 271, wherein said step of associating ones of said plurality of Fourier series comprises coupling said plurality of Fourier series based on a probability distribution.

277. (Previously Presented) A method according to claim 271, wherein said probability distribution is a Poissonian distribution.

278. (Previously Presented) A method according to claim 271, wherein said coupling is based on a spectral similarity of said plurality of Fourier series.

279. (Previously Presented) A method according to claim 271, wherein said probability operand is selected from the group of one and zero.

280. (Previously Presented) A method according to claim 279, wherein said desired value is one.

281. (Currently Amended) A system for recognizing a pattern in information comprising data using a computer comprising a memory, the system comprising:

an input layer operable to receive said data at the computer, wherein said data comprises information representative of one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest, and to encode said received data as parameters of a plurality of Fourier series in Fourier space, said plurality of Fourier series including input context of said data;

a ~~computer~~ memory comprising a set of initial ordered Fourier series;

an association layer operable to add associated Fourier series together to form a string using the computer;

an ordering layer operable to order said string based on relative degree of association of order formatted subsets of said string with relevant aspects of characteristics with respect to at least one of said initial ordered Fourier series to form an ordered string using the computer; and

a predominant configuration layer for receiving said ordered string using the computer and for assigning an activation probability parameter to each of said plurality of Fourier series using the computer to produce a predominant configuration string, generating a probability operand based on said activation probability parameter using the computer, said probability operand determining whether an activation of any one of said plurality of Fourier components and said plurality of Fourier series is to cause an activation of an associated another one of said plurality of Fourier components or Fourier series,

wherein the ~~computer~~ memory ~~is adapted to store~~ stores said predominant configuration string, said predominant configuration string allowing a determination of a relative association of a newly inputted information to said inputted information already processed, thereby recognition of a pattern in said information can be recognized.

282. (Previously Presented) A system according to claim 281, wherein said association layer is operable to associate Fourier series based on a spectral similarity between one another.

283. (Previously Presented) A system according to claim 281, wherein said probability operand is determined based on a historical value of said activation probability parameter and an activation rate of respective Fourier series.

284. (Previously Presented) A system according to claim 281, wherein said information context is encoded in time as delays corresponding to modulation of each Fourier component and Fourier series at corresponding frequencies.

285. (Previously Presented) A computer-implemented method of recognizing a pattern in information comprising data, the method comprising utilizing a computer comprising a processor to perform the steps:

providing an input layer operable to receive data, said data comprising said information, said information representative of one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest;

providing an association layer operable to add associated portions of said data together to form a string;

providing an ordering layer operable to order said string based on a relative degree of association of order formatted subsets of said string with relevant aspects of information of a standard string to form an ordered string;

providing a predominant configuration layer operable to receive a plurality of ordered strings to form a complex ordered string therefrom;

assigning, using said processor, an activation probability parameter to each of said input layer, said association layer, said ordering layer and said predominant configuration layer, said activation probability parameter being determined based on a historical value of said activation probability parameter and an activation rate of respective ones of said input layer, said association layer, said ordering layer and said predominant configuration layer;

generating a probability operand based on the activation probability parameter using said processor;

activating, using said processor, one or more of said input layer, said association layer, said ordering layer, said predominant configuration, said ordering layer, said predominant configuration layer, and said association layer if said probability operand has a desired value, whereby a pattern in said information is recognized according to a historical associative pattern in said data; and

storing said pattern in a memory of said computer.

286. (Currently Amended) A method according to claim 285, wherein said step of providing an ordering layer comprises ordering said string according to a plurality of associations between the information of the ~~plurality of~~ order formatted subsets ~~Fourier series~~ of said string and at least one ordered Fourier series from a high level memory.

287. (Previously Presented) A method according to claim 285, wherein said step of providing an input layer comprises providing an input layer operable to encode said received data as parameters of a plurality of Fourier series in Fourier space.

288. (Previously Presented) A method according to claim 285, wherein said step of providing an association layer comprises providing said association layer to associate Fourier series based on a spectral similarity between one another.

289. (Previously Presented) A method according to claim 285, wherein said probability operand has a binary value of one and zero, and said desired value is one.

290. (Currently Amended) A computer readable medium having stored thereon a computer program to implement a method of recognizing a pattern in information comprising data using a computer, said computer program comprising a plurality of codes for executing the steps of:

encoding, using the computer, said data as parameters of a plurality of Fourier components in Fourier space, wherein said information comprising said data represents one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest;

adding, using the computer, said plurality of Fourier components together to form a plurality of Fourier series in Fourier space, said plurality of Fourier series representing inputted information;

sampling, using the computer, at least one of said plurality of Fourier series in Fourier space with a filter to form a sampled Fourier series;

modulating, using the computer, said sampled Fourier series in Fourier space with said filter to form a modulated Fourier series;

determining, using the computer, a spectral similarity between said modulated Fourier series and another one of said plurality of Fourier series;

determining, using the computer, a probability expectation value based on said spectral similarity;

generating,using the computer, a probability operand based on said probability expectation value;

adding, using the computer, said modulated Fourier series and said another Fourier series, if said probability operand has a desired value, to form a string of Fourier series in Fourier space, said string representing an association between Fourier series to thereby allow recognition of a pattern in the information; and

storing said string in a memory of the computer.

291. (Previously Presented) A computer-readable medium according to claim 290, further comprising storing said string of Fourier series to a memory.

292. (Previously Presented) A computer-readable medium according to claim 290, wherein said probability operand has a value selected from the set of one and zero.

293. (Previously Presented) A computer-readable medium according to claim 292, wherein said desired value is one.

294. (Currently Amended) A method for recognizing a pattern in information and establishing an order formatted pattern in information with respect to standard ordered information, the method performed in a computer and comprising:

a.) obtaining, using the computer, a string comprising a sum of Fourier series from a computer memory, said string representing information that represents a one or more physical characteristics or one or more representations of physical characteristics within physical context of an item of interest;

b.) selecting, using the computer, at least two filters from a selected set of filters;

c.) sampling, using the computer, the string with the filters such that each of the filters produces a sampled Fourier series, each Fourier series comprising a subset of the string;

d.) modulating, using the computer, each of the sampled Fourier series in Fourier space with the corresponding selected filter such that each filter produces an order formatted Fourier series;

e.) adding, using the computer, the order formatted Fourier series produced by each filter to form a summed Fourier series in Fourier space;

f.) obtaining, using the computer, an ordered Fourier series from the memory;

g.) determining, using the computer, a spectral similarity between the summed Fourier series and the ordered Fourier series;

h.) determining, using the computer, a probability expectation value based on the spectral similarity;

i.) generating, using the computer a probability operand based on the probability expectation value;

j.) repeating steps b-i until the probability operand has a desired value, when said probability operand has a desired value a pattern in information has been recognized and an order formatted pattern in the information has been established;

k.) storing the summed Fourier series to an intermediate memory;

l.) removing the selected filters from the selected set of filters to form an updated set of filters;

m.) removing the subsets from the string to obtain an updated string;

n.) selecting an updated filter from the updated set of filters;

o.) sampling the updated string with the updated filter to form a sampled Fourier series comprising a subset of the string;

p.) modulating the sampled Fourier series in Fourier space with the corresponding selected updated filter to form an updated order formatted Fourier series;

q.) recalling the summed Fourier series from the intermediate memory;

r.) adding the updated order formatted Fourier series to the summed Fourier series from the intermediate memory to form an updated summed Fourier series in Fourier space;

s.) obtaining an updated ordered Fourier series from the high level memory;

t.) determining a spectral similarity between the updated summed Fourier series and the updated ordered Fourier series;

u.) determining a probability expectation value based on the spectral similarity;

v.) generating a probability operand based on the probability expectation value;

w.) repeating steps n-v until the probability operand has a desired value or all of the updated filters have been selected from the updated set of filters, when the probability operand has a desired value a pattern in information has been recognized and an order information pattern in the information has been established;

x.) if all of the updated filters have been selected before the probability operand has a desired value, then clearing the intermediate memory and returning to step b;

y.) if the probability operand has a desired value, then storing the updated summed Fourier series to the intermediate memory;

z.) repeating steps l-y until one of the following set of conditions is satisfied: the updated set of filters is empty, or the remaining subsets of the string of step m.) is nil; and

aa.) storing the Fourier series in the intermediate memory in the high level memory, said updated summed Fourier series representing said plurality of Fourier series in said strings ordered according to a plurality of associations between the information of the plurality of order formatted subset Fourier series and the at least one ordered Fourier series from high level memory.

295. (Previously Presented) A method according to claim 294, wherein information is represented by a sum of Fourier series in Fourier space.

296. (Previously Presented) A method according to claim 294, further comprising encoding data which includes modulating at least one of said Fourier components to provide an input context.

297. (Previously Presented) A method according to claim 294, wherein inputted information comprises data and an input context, said input context mapping on a one to one basis to a physical context, said physical context being a relationship between physical characteristics represented by said inputted information.

298. (Previously Presented) A method according to claim 294, wherein each Fourier component of said at least one Fourier series comprises a quantized amplitude, a frequency, or a phase angle.

299. (Previously Presented) A computer readable medium having stored thereon a computer program to implement a method of recognizing a pattern in information comprising data and establishing an order formatted pattern in the information, said computer program comprising a plurality of codes for executing the steps of:

providing an input layer operable to receive data, said information comprising said data representative of one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest;

providing an association layer operable to add associated portions of said data together to form a string;

providing an ordering layer operable to order said string based on a relative degree of association of order formatted subsets of said string with relevant aspects of information of a standard string to form an ordered;

providing a predominant configuration layer operable to receive a plurality of ordered strings to form a complex ordered string therefrom;

assigning an activation probability parameter to each of said input layer, said association layer, said ordering layer and said predominant configuration layer, said activation probability parameter being determined based on a historical value of said activation probability parameter and an activation rate of respective ones of said input layer, said association layer, said ordering layer and said predominant configuration layer;

generating a probability operand based on the activation probability parameter;

activating one or more of said input layer, said association layer, said ordering layer, said predominant configuration, said ordering layer, said predominant configuration layer, and said association layer if said probability operand has a desired value, whereby a pattern in said information is recognized according to a historical associative pattern in said data; and

displaying said pattern on a display device.

300. (Previously Presented) A computer readable medium according to claim 299, wherein said input layer is operable to encode said received data as parameters of a plurality of Fourier series in Fourier space.

301. (Previously Presented) A computer readable medium according to claim 299, wherein said association layer is operable to associate ones of said plurality of Fourier series based on a spectral similarity between one another.

302. (Previously Presented) A computer readable medium according to claim 299, wherein said probability operand has a binary value of one or zero

303. (Previously Presented) A computer readable medium according to claim 302, wherein said desired value is one.

304. (Currently Amended) A computer program product for use in a system for recognizing a pattern in information comprising data, said computer program product comprising:

a computer readable medium having stored thereon program code means, said program code means comprising:

means for receiving data from a transducer at a computer, and to encode said received data as parameters of a plurality of Fourier series in Fourier space, said plurality of Fourier series including input context of said data, wherein said information comprising said data represents one or more physical characteristics or one or more representations of physical characteristics within a physical context of an item of interest;

means for associating Fourier series together to form a string using the computer;

means for ordering said string based on a relative degree of association of order formatted subsets of said string with relevant aspects of information of a standard string to form an ordered string using the computer;

means for forming a complex ordered string from a plurality of ordered strings, said complex ordered string representing a historical association and order of processed and stored information to thereby allow recognition of a pattern in information using the computer; and

means for storing said complex ordered string in a memory.

305. (Currently Amended) A computer program product according to claim 304, further comprising storing said complex ordered string in high level memory.

306. (Previously Presented) A computer program product according to claim 305, wherein said means for associating is operable to associate ones of said plurality of Fourier series based on a spectral similarity between one another.

307-322. (Canceled)